ENGAGING DIVERSE STUDENTS: UTILISING A SERIES OF SIMPLE REACTIONS TO "EXPERIENCE" CHEMISTRY

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KEYWORDS: student engagement, mature age students, chemistry laboratory

BACKGROUND

It can be challenging to engage and motivate students as they embark on their first experience of a chemistry course. This study is based on a diverse cohort of 288 mature age students, ranging from 20-40 years with no chemistry background. This mixture of part time and full time students had just completed a one semester pre-university introductory chemistry course without any practical component. This study describes the educational analysis of one specifically designed laboratory practical and an analysis of the student learning experience.

AIMS

- To determine if one specifically designed laboratory practical can engage a diverse group of mature age students?
- To assess whether students feel this was a worthwhile learning experience?
- To determine whether mode of attendance, full time or part time, has an impact on student engagement?
- To determine which aspects of the practical the students report as most and least valuable?

DESCRIPTION

The students are required to carry out six chemical reactions, plus one modelling exercise. This includes recording all observations, balancing equations, using correct formulae, testing for and listing the states of the reactants and products. Working in groups of three or four the students moved from station to station to complete each of the reactions. The demonstrators were able to challenge the students by asking them to explain what was happening in each reaction.

DESIGN AND METHODS

The educational analysis of this laboratory practical was performed using the ASELL* approach, a trialled and tested methodology which facilitates student learning taking into account variations in student background.

This approach involves three phases of review: (1) testing in a workshop with subsequent feedback, (2) surveying the originating university and finally (3) peer review. The analysis uses survey and open ended responses to explore the individual student experience and the educational intent of the laboratory practical.

RESULTS

Over 90% of the participants rated the "experience" as excellent, indicated a high level of interest and enjoyment and considered it a worthwhile exercise. There were 236 individual comments in the open response survey which indicated that the group engaged with the content and believed they had acquired an increased level of confidence in their laboratory skills. Mode of attendance did not have any significant impact on the level of engagement with both cohorts rating the experience as excellent. The aspects of the laboratory which the students enjoyed most was the interaction with the demonstrators and seeing the relevance of the experiment to their chemistry studies. 90% of the students strongly agreed that the experiment increased their understanding of chemistry.

CONCLUSIONS

The analysis of the experiment using the ASELL methodology ensured that the laboratory practical was appropriate for the student cohort and delivered a valuable learning experience by engaging the students.
The results of this study have implications for successfully introducing the practical aspects of chemistry to mature age students from a range of diverse, non-traditional backgrounds in pre-university or foundational chemistry courses.

* Advancing Science by Enhancing Learning in the Laboratory

Proceedings of the Australian Conference on Science and Mathematics Education, University of Sydney, Sept 29th to Sept 30th, 2014, page 14, ISBN Number 978-0-9871834-3-9.